

REMARKS

An Excess Claim Fee Payment Letter, and corresponding excess claim fee, is submitted herewith for five (5) excess claims.

Claims 1-25 are all the claims presently pending in the application. Claims 2, 4-8 and 10-16 have been merely editorially amended and have not been substantively amended to more particularly define the invention. Claims 21-25 have been added to claim additional features of the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Applicants gratefully acknowledge the Examiner's indication that claims 6 and 12 would be allowable if rewritten in independent form, that claims 14 and 15 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph (listed below) and rewritten in independent form, and that claim 16 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph (listed below).

Claims 13-16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1-5, 7-11, 13, 17, and 18 stand rejected under 35 U.S.C. §102(b) as being anticipated by Sano, et al. (U.S. Patent No. 5,116,254; hereinafter "Sano").

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as defined by exemplary claim 1) is directed to a vehicle steering apparatus. The vehicle steering apparatus includes a steering mechanism for turning

a steerable tired-wheel, a steering actuator for providing a steering force to the steering mechanism, a load detecting unit for detecting a tire load, which is a load applied to a tire of a vehicle, and a steering control unit for controlling the steering actuator according to the tire load detected by the load detecting unit (e.g., see Application at page 7, line 20 through page 8, line 6). This combination of features is important for enabling steering control in which the road conditions are accurately reflected based on the detected load applied to the tire (see Application at page 7, lines 1-5).

II. THE 35 U.S.C. 112, SECOND PARAGRAPH, REJECTION

Claims 13-16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants respectfully submit that claims 13-16 have been editorially amended to more clearly define the claimed invention.

Specifically, claim 13 has been amended, and similarly claim 16, to replace the phrase “the physical amount” with the phrase “a physical amount” to provide proper antecedent basis. Additionally, claim 15 has been amended to change its dependency from claim 13 to claim 14 to provide proper antecedent basis for the features “second determining unit” and “predetermined second reference”. Similarly, claim 14 has been amended to change its dependency from claim 11 to claim 13.

Applicants respectfully submit that the proposed claim amendments overcome the Examiner’s rejection under 35 U.S.C. § 112, second paragraph. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. THE PRIOR ART REFERENCE

The Examiner alleges that Sano teaches the claimed invention of claims 1-5, 7-11, 13, 17 and 18. Applicants respectfully submit, however, that Sano does not teach or suggest each and every feature of the claimed invention.

That is, Sano does not teach or suggest "*a steering actuator for providing a steering force to the steering mechanism*" as recited in claim 1, and somewhat similarly recited in claims 7, 13 and 16.

The Examiner attempts to rely on Figures 1 and 8-12 of Sano to support his allegation. The Examiner, however, is clearly incorrect.

That is, nowhere in this figure (nor anywhere else for that matter) does Sano teach or suggest a steering actuator for providing a steering force to the steering mechanism. Indeed, in Sano the steer mechanism is directly controlled by the steering wheel.

The claimed invention is directed to a steer-by-wire vehicle steering system. A steer-by-wire vehicle steering system is a steering system wherein the mechanical linkage between the steering wheel and the steering mechanism is eliminated. Steering of the tires of the vehicle is achieved by converting motion of a steering actuator into a linear movement of a turning shaft and then converting the linear movement of the turning shaft into turning movement of the front left and right steerable wheels (see Application at page 23, lines 12-24 and Figure 1). Therefore, as recited in exemplary claim 1, the steering actuator provides the steering force to the steering mechanism to control the front wheels of the vehicle.

In stark contrast, Sano is not directed to a steer-by-wire vehicle steering system. That is, Sano teaches a mechanical linkage between the steering wheel and the steering mechanism. Indeed, Sano teaches that the steering wheel (1) is connected to a gear box (3) through a steering shaft (2). A tire rod (4) connects the gear box (3) to the front wheels (5)

through knuckle arms (6) (see Sano at Figure 1). Therefore, Sano clearly teaches that there is a direct mechanical connection from the steering wheel (1) to the steering mechanism (2,3).

Sano does not teach or suggest an actuator for providing a steering force to the steering mechanism (2,3). Indeed, the steering force is directly applied to the steering mechanism (2,3) from the steering wheel (1).

The Examiner attempts to rely on the rear wheel servo-actuator (8) to support his allegations that Sano teaches or suggests a steering actuator for providing a steering force to the steering mechanism. The rear wheel servo-actuator (8) merely provides a signal from a computer (12) in the vehicle to maintain the steering of the rear wheels in accordance with the mechanically steered front wheels. The rear wheel servo-actuator (8) does not provide a steering force to the steering mechanism to control the steering of the front wheels, as recited in exemplary dependent claim 22.

Therefore, Applicants submit that Sano does not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. NEW CLAIMS

New claims 20-25 have been added to provide more varied protection for the claimed invention and to claim additional features of the invention. These claims are independently patentable because of the novel features recited therein.

Applicants submit that new claims 20-25 are patentable over any combination of the applied references at least for analogous reasons to those set forth above with respect to claims 1-19.

V. FORMAL MATTERS AND CONCLUSION

Applicants have amended the claims in accordance with the Examiner's objections. Specifically, regarding the Examiner's objection of claim 13, Applicants have replaced the phrase "is which" with the phrase "in which" to correct the informality.

In view of the foregoing, Applicants submit that claims 1-25, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: November 10, 2005



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